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(54) **Window frame for a motor vehicle.**

(57) There is disclosed a motor vehicle (1) comprising a body (2) with a door (3a) mounted in a door opening of the body, the door being provided with a window frame (5) which defines a window opening in which a pane of glazing material is movable, the window frame (5) comprising :

(i) a structural member (20) defining the window opening of the door and which is composed of a single length of constant cross-section rolled metal having a rounded junction (8) between the top rail (5a) of the frame and the "B" pillar (5b) as formed by bending the length of rolled metal ; and

(ii) a single length of a glass run channel component (23) secured to the structural member (20), said glass run channel including a rigid outer wall element (29) defining an outer boundary of the window frame whereby the pane (31) of glazing material is held substantially flush with the outer surface of adjacent regions of the vehicle body.

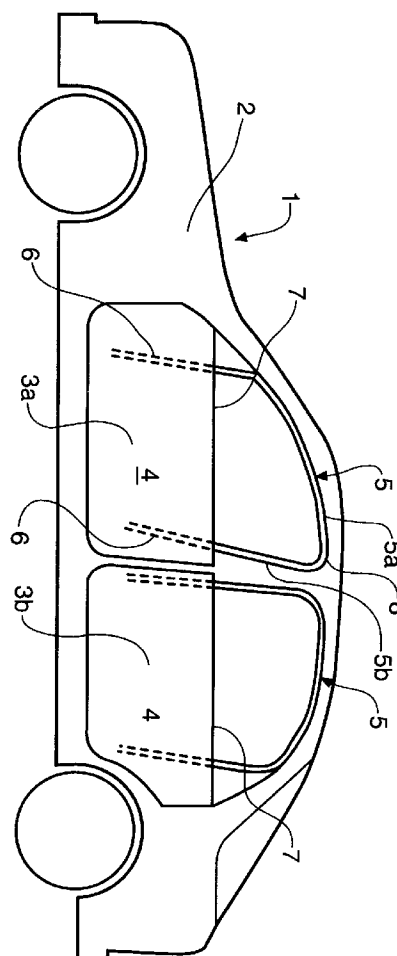


Figure 1

This invention relates to a vehicle window frame in which the structural member of the frame is formed by stretch bending a single length of rolled metal.

The structural part of the window frame of an automobile door is generally formed by one of three basic methods. In a first, widely used, method, the frame is formed of, usually, two stamped parts which are joined together by welding. In a second method, a sheet of metal (usually steel) is rolled to form a desired tubular cross-section. This rolled section is then cut to the required length and bent, usually stretch bent, to the desired shape. With modern car design, this method is somewhat less preferred than the stamping method because it requires that the window frame must have a constant cross-section. By contrast, the stamping method enables the window frame to have a variable cross-section. Moreover, when the junction between the so-called "B" post and the top rail of the door frame is to be square, the rolled channel section must be cut and then mitred together; this problem does not arise when the window frame is stamped.

In a third method of forming the structural member of a window frame for a motor vehicle, the member is extruded from a metal such as aluminium and then bent to the desired shape; this method is less common in the art than the first two mentioned above.

It would be desirable to take advantage of the inherent strength of a rolled channel member in association with other desirable features of window frame technology.

In accordance with the present invention, there is provided a motor vehicle comprising a body with a door mounted in a door opening of the body, the door being provided with a window frame which defines a window opening in which a pane of glazing material is movable, the window frame comprising:

- (i) a structural member defining the window opening of the door and which is composed of a single length of constant cross-section rolled metal having a rounded junction between the top rail of the frame and the "B" pillar as formed by bending the length of rolled metal; and
- (ii) a single length of a glass run channel component secured to the structural member, said glass run channel including a rigid outer wall element defining an outer boundary of the window frame whereby the pane of glazing material is held substantially flush with the outer surface of adjacent regions of the vehicle body.

For the first time, the present invention provides a flush glazing system for a motor vehicle in which there are no moulded or mitred corners in the window frame. Thus, the invention provides a window frame in which the structural member is formed of a single length of rolled metal, and in which the pane of glazing material is substantially flush with the outer surface of the adjacent regions of the vehicle body. Previous-

ly, such arrangements have been exclusive to window frames formed by the stamping method as described above.

The present invention represents a trend away from conventional window frame design where the junction between the top rail and the "B" post is square, as formed, for example, by a moulding and/or mitring technique. The present invention brings with it particular economic advantages, such as the reduced equipment required to manufacture the window frame.

The window frame of the invention also has the advantage that both the structural member and the glass run channel can each have a separate neutral axis. Previous arrangements have required all elements of the frame to bend about the same axis, which can lead to significant distortions in the final component.

The structural member of the door frame is composed of a single length of constant cross-section rolled metal. The technique of "rolling" to produce a structural member is well known in the art, and enables a member of complex cross-section to be formed. In the process, a strip of metal is progressively rolled by a series of rollers into the desired cross section. Opposite sides of the strip are then joined together, for example in a welding operation to form the rolled channel. It is normal that this rolled channel is formed in a continuous process. For the purposes of the invention, a length of this rolled channel is taken and bent to the desired shape to define the window opening of the vehicle door. As stated above, the junction between the top rail of the frame and the "B" pillar is rounded, as formed by bending, normally stretch bending, the length of rolled metal.

Separate from the structural member, a single length of a glass run channel component is fabricated, for example by an extrusion technique. At least one of the walls of the glass run channel is made rigid as it is to form an outer boundary of the window frame. Preferably, the whole of the glass run channel part will be provided with a rigid, shape sustaining core.

The specific shape of the glass run channel is to be determined by the skilled person. For instance, the glass run channel may be provided with a second channel shaped region, which is inversely disposed in relation to the glass run channel, to receive a flange or pinch weld of the structural member. Alternatively, other means may be provided whereby the glass run channel is secured to the structural member.

The glass run channel is bent into the desired shape and is then secured to the structural member to form the window frame.

In addition, a margin seal, which is a type of seal known per se in the industry and which is composed of a support element and a sealing lip, may be provided on the glass run channel such that the sealing lip extends away from the glass run channel in the plane

of the surface of the body of the vehicle. The margin seal may be a separate element from the glass run channel and fastened thereto by a suitable fastening means. Alternatively, the margin seal may be provided as an integral part of the glass run channel, for example by being formed with the glass run channel in an extrusion operation.

According to another aspect of the invention, there is provided the window frame employed in the motor vehicle of the first aspect of this invention.

For a better understanding of the present invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings in which:

Figure 1 is a side view of a motor vehicle in accordance with the present invention; and

Figure 2 is a cross-section through a combined window frame and glass run channel of the invention.

In figure 1, motor vehicle 1 has a body 2 and front door 3a and rear door 3b. Each of the doors 3a and 3b has a lower part 4 and an upper window frame 5 the ends 6 of which extend below the so-called waist line 7 where they are secured to the inside of the door (not shown). The structural element of the frame 5 is formed by stretch bending a rolled channel member. As a consequence, the junction 8 of the frame between the "B" post 5b and the top rail 5a is rounded, and not square.

In figure 2, the combined window frame and glass run channel of the invention is shown. This comprises a tubular structural member 20 which is formed by rolling a metal sheet to the desired cross-section. The ends are joined in a pinch weld 21 which extends to form a flange 22. Secured to the flange 22 is a sealing strip 23 formed of an elastomeric material such as a rubber or a plastics material which, in the embodiment shown, comprises two inversely disposed channels 24 and 25. Channel 24 is a glass run channel provided with lips 26 and 27. Channel 25, which is inversely disposed with respect to channel 24 is capable of fitting over and gripping the flange 22 of the structural member, by virtue of ribs, as known in the art. Channels 24 and 25 share a common wall 28. The outer wall 29 of the glass run channel retains window 31. This outer wall 31, as well as the remainder of the sealing strip 23, include a rigid, shape sustaining core 32, preferably made of a metal. Integral with the sealing strip 23 is a margin seal 33 which includes a lip 34 extending away from the outer wall 29.

Claims

1. A motor vehicle comprising a body with a door mounted in a door opening of the body, the door being provided with a window frame which defines a window opening in which a pane of glazing

material is movable, the window frame comprising:

- (i) a structural member defining the window opening of the door and which is composed of a single length of constant cross-section rolled metal having a rounded junction between the top rail of the frame and the "B" pillar as formed by bending the length of rolled metal; and
- (ii) a single length of a glass run channel component secured to the structural member, said glass run channel including a rigid outer wall element defining an outer boundary of the window frame whereby the pane of glazing material is held substantially flush with the outer surface of adjacent regions of the vehicle body.

2. A motor vehicle according to claim 1, wherein the structural member and the glass run channel each have a separate neutral axis.
3. A motor vehicle according to claim 1 or 2, wherein the glass run channel component is provided with a second channel shaped region, which is inversely disposed in relation to the glass run channel, to receive a flange or pinch weld of the structural member.
4. A motor vehicle according to claim 1, 2 or 3, which also includes a margin seal comprising a support element and a sealing lip, the margin seal preferably being provided on the glass run channel such that the sealing lip extends away from the glass run channel in the plane of the surface of the body of the vehicle.
5. A motor vehicle according to claim 4, wherein the margin seal is an integral part of the glass run channel component.
6. A motor vehicle according to any preceding claim, wherein, in the glass run channel component, the whole of the glass run channel part is provided with a rigid, shape-sustaining core.
7. A motor vehicle according to any preceding claim, wherein the structural member is composed of a single length of constant cross-section metal which has been "rolled" to produce a member of complex cross-section, with opposite sides being joined to form a closed channel if desired, followed by bending to form the rounded junction.
8. A motor vehicle according to any preceding claim, wherein the glass run channel component is formed by extrusion.

9. For use in a motor vehicle as claimed in any preceding claim, a window frame as defined in any preceding claim.

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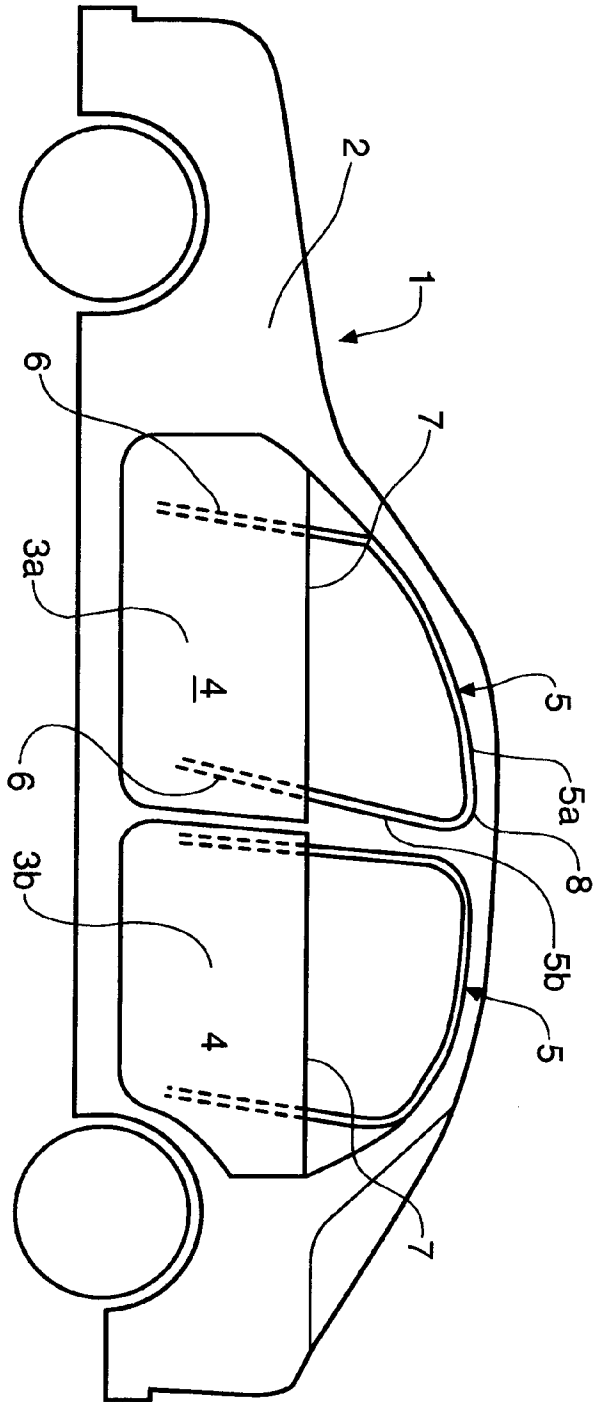


Figure 1

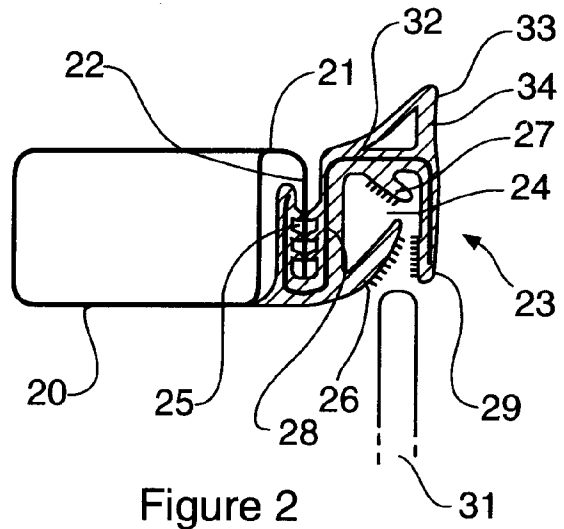


Figure 2



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 95 30 0234

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	DE-B-12 42 105 (SCHRÖDER) * the whole document * ---	1,3-9	B60J5/04 B60J10/06
Y	GB-A-500 534 (BUDD) * page 1, line 66 - line 100; figure 1 * ---	1,3-6,9	
Y	EP-A-0 490 733 (HUTCHISON-RENAULT) * column 7, line 15 - line 37; figure 3 * -----	1,3-9	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B60J
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 7 April 1995	Examiner Foglia, A
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